



# National Plant Monitoring Scheme

## Online Training Materials 6: Introduction to Bog and Wet Heath



UK Centre for  
Ecology & Hydrology



Botanical Society  
of Britain & Ireland



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# National Plant Monitoring Scheme

An introduction to UK National Plant Monitoring Scheme broad habitat type

## **BOG AND WET HEATH**



Produced by Ben Averis for the NPMS in June 2020



## UK National Plant Monitoring Scheme broad habitat type **BOG AND WET HEATH**

This broad habitat, which is divided into three fine-scale habitats – **blanket bog**, **raised bog** and **wet heath** – occurs on damp to very wet peaty soils and its vegetation consists mainly of dwarf shrubs, sedges, grasses and mosses.

Bogs are mostly on level to gently sloping surfaces of peat at least 50 cm deep, but can occur on peat shallower than this. Wet heath is mainly on level to moderately sloping surfaces of peat less than 50 cm deep, but can be on deeper peat that would once have had bog vegetation but has since become drier, and can also be on shallow peat on quite steep slopes. Peat depth and slope gradient are therefore not the best ways to define and classify bogs and wet heaths, because they do not consistently determine the species composition of the vegetation.

Blanket bogs and raised bogs can be very alike in terms of their vegetation. Their defining differences are hydrological. Raised bogs are gentle domes of deep peat that have built up over time in a previously water-filled basin. They occur mainly in the lowlands. Blanket bogs are on peat that has built up to form a blanket-like cover over level to gently undulating terrain. They are mainly in upland areas with a climate that is cooler and/or wetter than in most areas with raised bogs. This cool, wet climate has encouraged the growth of peat-building plants – *Sphagnum* mosses and hare's-tail cottongrass *Eriophorum vaginatum* – hence the formation of extensive peat cover. Wet heaths and bogs share many plant species with each other (though there differences between them that reflect the rather drier but still damp to wet soils in wet heaths) and with dry heaths. The main vascular plant species in wet heaths and bogs are shown in the next two pages: the first page shows species that are mostly in wet heaths and bogs but no more than sparse in dry heaths; the second page shows species that are at least as common in dry heaths as they are in wet heaths and bogs.



Bog in Sutherland in August



Wet heath in Sutherland in September



Dry heath in Aberdeenshire in May

*Note: in this document, flowering periods of plant species are given numerically (e.g. 5-6 = May-June); this information is taken from Collins Flower Guide ISBN 978-0-00-718389-0*



**Species that are common in bogs and wet heaths, but no more than sparse in dry heaths.** They are all listed as NPMS positive indicators in wet heaths and all bogs, except that deergrass is not listed for raised bog and hare's-tail cottongrass not listed for wet heath.



Fl 7-9

**Cross-leaved heath**  
*Erica tetralix*.  
Greyish-green leaves in whorls of 4 and with whitish hairs.



Fl 5-6 (fruits 7-8)

**Deergrass**  
*Trichophorum germanicum*. Dense tufts of straight stems, each with a small flower spike at its tip. Turns a rich golden colour in autumn.



Fl 7-9

**Purple moor-grass**  
*Molinia caerulea*. Tussocks (can be large) of long leaves that turn buff in autumn. Long, narrow, branched flower heads.



Fl 5-6 (fruits 6-9)

**Common cottongrass**  
*Eriophorum angustifolium*. Multiple cottony heads. Leaves 3-6 mm wide; reddish in autumn. Does not form tussocks.



Fl 4-5 (fruits 5-6)

**Hares's-tail cottongrass**  
*E. vaginatum*. Single cottony heads. Dense tussocks of 'wiry' leaves <1 mm wide, turning dull grey-brown in autumn. More or less confined to bogs.



Fl 4-5

**Bog myrtle** *Myrica gale*. Narrow oval leaves with a few large, shallow teeth. Leaves have a strong resinous scent. Young stems reddish.



Dwarf shrub species that are common in bogs and/or wet heaths, and are at least as common in dry heaths.



Fl 7-9

**Heather *Calluna vulgaris*.**

Leaves tiny and not in whorls. Very small pale pink flowers. Very common in dry heaths, wet heaths and bogs. NPMS positive indicator in wet heath and all bogs.



Fl 7-9

**Bell heather *Erica cinerea*.**

Leaves in whorls of 3. Bright mid pink-purple flowers. Common in dry heaths and some wet heaths. NPMS positive indicator in wet heath and blanket bog (but rare in bogs).



Fl 4-6

**Bilberry (Scottish = blaeberry) *Vaccinium myrtillus*.**

Stems green and ridged. Leaves oval and pointed, with toothed edges. Common in dry heaths and some wet heaths and bogs. NPMS positive indicator in wet heath and all bogs.



Fl 6-8

**Cowberry *Vaccinium vitis-idaea*.**

Stems browner, not ridged. Leaves dark, evergreen, blunt and untoothed. Common in some dry heaths and bogs; scarcer in wet heaths. NPMS positive indicator in raised bog.



Fl 5-6

**Crowberry *Empetrum nigrum*.**

Leaves in whorls or not; quite thick + white stripe running up underside. Common in some dry heaths and bogs; scarcer in wet heaths. NPMS positive indicator in bogs.



**Bogs and wet heaths – shared species.** While wet heaths and bogs share some species with dry heath (especially heather, but also bell heather, bilberry, cowberry and crowberry), they differ from dry heaths in having extensive total cover of one or more of the following six wetland species that are no more than sparse in dry heaths: cross-leaved heath, deergrass, purple moor-grass, common cottongrass, hare’s-tail cottongrass and bog myrtle.

**What makes bog vegetation different from wet heath vegetation?** Bogs have an abundance (collectively) of one or more of **hare’s-tail cottongrass** *Eriophorum vaginatum* and the mosses *Sphagnum papillosum* (big and ochre-coloured) and *S. magellanicum* (big and dull red; split in recent years into *S. divinum* and *S. medium*, the latter being the more common and both looking very alike). These bog indicators are no more than very sparse in wet heaths (and are not seen at all in dry heaths, save for the very occasional tuft of hare’s-tail cottongrass in some types).



Good indicators of bog habitat. L: Hare’s-tail cottongrass *Eriophorum vaginatum*. Above R: *Sphagnum papillosum*. Below R: *Sphagnum medium*.



Here is a mix of *Sphagnum papillosum* (pale ochre colour) and *S. capillifolium* (red). *S. papillosum* is very common in the wetter bog habitats. *S. capillifolium* has shorter, narrower branches, so the whole flower-like 'head' (capitulum) is smaller than in *S. papillosum*.





If you see red *Sphagnum* it is most likely to be *S. capillifolium*, which is much the commonest *Sphagnum* of this colour and grows in bogs, heaths and various other habitats. *S. divinum* and *S. medium* – both mainly bog species – are larger, being the same size as *S. papillosum*. Here are photos of *S. capillifolium* (L) and *S. medium* (R), both to the same scale.







Within bogs the relative proportions of hare's-tail cottongrass, *Sphagnum papillosum* and *S. divinum/medium* vary. Some bogs, especially those that are not as excessively wet, have a co-dominance of hare's-tail cottongrass and heather, accompanied by mosses including *Sphagnum capillifolium* but little or no *S. papillosum/divinum/medium*. Here is an example of this *Calluna-Eriophorum vaginatum* bog: this kind of vegetation is particularly common in blanket bogs on level to moderately sloping ground in the colder (e.g. higher-altitude) parts of the British and Irish uplands.



*Calluna vulgaris-Eriophorum vaginatum* bog in the Southern Uplands in July



Here is another example of heather/hare's-tail cottongrass bog, in Perthshire in July.





Conversely, some of the wetter bogs, especially at low altitudes in the west, can have plenty of *Sphagnum papillosum* but not very much hare's-tail cottongrass. Here is an example in north-west Sutherland in June. Other species here include *S. capillifolium*, heather, cross-leaved heath, common cottongrass, purple moor-grass and bog myrtle.





This blanket bog in Northern Ireland in October has plenty of hare's-tail cottongrass and *Sphagnum papillosum* (as well as heather, cross-leaved heath, deergrass, common cottongrass, bog asphodel and *S. capillifolium*).





The mix of plant species in bogs reflects the habitat of deep wet peat with a rain-fed water supply. Without mineral enrichment from bedrock/groundwater sources the habitat is acidic and nutrient-poor; hence the adaptation by sundews (*Drosera* species) to obtain nutrients by catching insects. Here is round-leaved sundew *D. rotundifolia*: a common species in our wetter bogs and a NPMS positive indicator in all three fine-scale habitat types. Two other sundews grow in bogs and wet heaths and have narrow oval leaves: oblong-leaved sundew *Drosera intermedia* (leaf blade c. 1 cm long; flower stem starting below leaf rosette; NPMS positive indicator in wet heath) and great sundew *D. anglica* (leaf blade c.3 cm long; flower stem growing straight up from middle of leaf rosette; NPMS positive indicator in blanket and raised bogs).



Fl 6-8



A couple of pages back I mentioned bog asphodel *Narthecium ossifragum*. It looks rather like a yellow orchid. Its leaves are in a flattened spike as in yellow flag but of course much smaller. Despite its name it isn't just in bogs; it also grows in some wet heaths and other mires. It is a NPMS positive indicator in blanket bogs, raised bogs and wet heaths.





Bog myrtle *Myrica gale*, could be misleading in the same way, as its name might suggest it as a potential bog indicator but it grows equally commonly in wet heaths and purple moor-grass *Molinia caerulea* mires.



Fl 4-5



Talking of purple moor-grass *Molinia caerulea*, this species can attain dominance on some bogs. These are mostly at low altitude, and the dominance of *Molinia* is largely the result of land management: burning and/or grazing, both of which can reduce the cover of dwarf shrubs to the benefit of *Molinia*. The vegetation can be very species-poor. Something similar happens in wet heaths too, leading to extensive *Molinia* mire on shallower peats on gentle slopes. I'll show a photo of that later, when we're looking at wet heaths, but here now is a photo of species-poor *Molinia* bog; this example is in Wester Ross, in July.







Another type of modified bog in which dwarf shrubs have been reduced or even lost altogether (one could say 'green' bog) has a sward of hare's-tail cottongrass *Eriophorum vaginatum*. Heavy grazing appears to be the main factor behind the dominance of this species here, though in parts of the southern Pennines atmospheric pollution appears to have played a role too. This example is in Argyll, in June.



Note: while heather and bell heather are palatable to sheep and deer, cross-leaved heath is not, so bog or wet heath can be quite heavily grazed but still look heathy, with abundant cross-leaved heath as the main or only dwarf shrub.



In some areas of bog that have been modified by intensive grazing and associated trampling, there is not only a lack of heather but also a change in the moss layer from the normal mix of gold and red *Sphagnum* species (*S. papillosum*, *S. capillifolium* and *S. divinum/medium*) to a dominance of two very common species of a wide range of wet acid habitats. These species are *S. fallax* and *Polytrichum commune*, and together they add to the green look of these modified bogs. Here is an example, in Northern Ireland. Inset photos: *S. fallax* (top) and *P. commune* (bottom).





All of the bog photos so far have been of blanket bog. Raised bog – a different NPMS fine-scale habitat type – can look similar. Here is blanket bog in Sutherland in September (top photo) and raised bog in Cumbria in November (bottom).





Raised bogs differ in being gentle domes of deep peat, but when standing in the middle of one, it can seem just as flat as a flat area of blanket bog. However, toward the edges a raised bog slopes gradually down to the 'lagg' zone which can have some mineral enrichment and a mix of other type of wetland habitats such as rush mire, sedge mire, reedbed, meadowsweet fen and wet woodland. Here at this raised bog site near Livingston (to the west of Edinburgh) we can see the peat dome sloping down very gradually to the right, into a lagg zone of wet woodland and rush mire.





Raised bog vegetation can be indistinguishable from that on a blanket bog. In both habitats it varies from very heathery to 'greener' with less heather but much cottongrass or purple moor-grass, and also varies from wetter (with much *Sphagnum papillosum/divinum/medium*) to drier with less *Sphagnum* or with *S. capillifolium* being the main or only *Sphagnum*. However, a few species are more common in raised bogs than in blanket bogs (though they can grow in blanket bogs too, so they are not definite indicators of raised bog habitat): cranberry *Vaccinium oxycoccus* (NPMS positive indicator in blanket and raised bogs), bog rosemary *Andromeda polifolia* and *Sphagnum divinum/medium*.



Fl 6-8

Cranberry *Vaccinium oxycoccus* and *Sphagnum medium*



Fl 5-9

Bog rosemary *Andromeda polifolia*



Bog pools are most common in the wetter blanket bogs in northern Scotland, as here in Sutherland where they contain much bogbean *Menyanthes trifoliata* (a NPMS positive indicator in blanket/raised bogs and wet heaths).





Other types of bog pool have shallow water partly filled with *Sphagnum* mosses (as in the photo on the left, taken in Argyll in June) or with swards of common cottongrass *Eriophorum angustifolium* (in the photo on the right, growing with *Sphagnum* mosses in a bog pool in the Southern Uplands in October).



Who needs 'lovely' or 'pretty' flowers when there are such colours and textures as these in the hills?

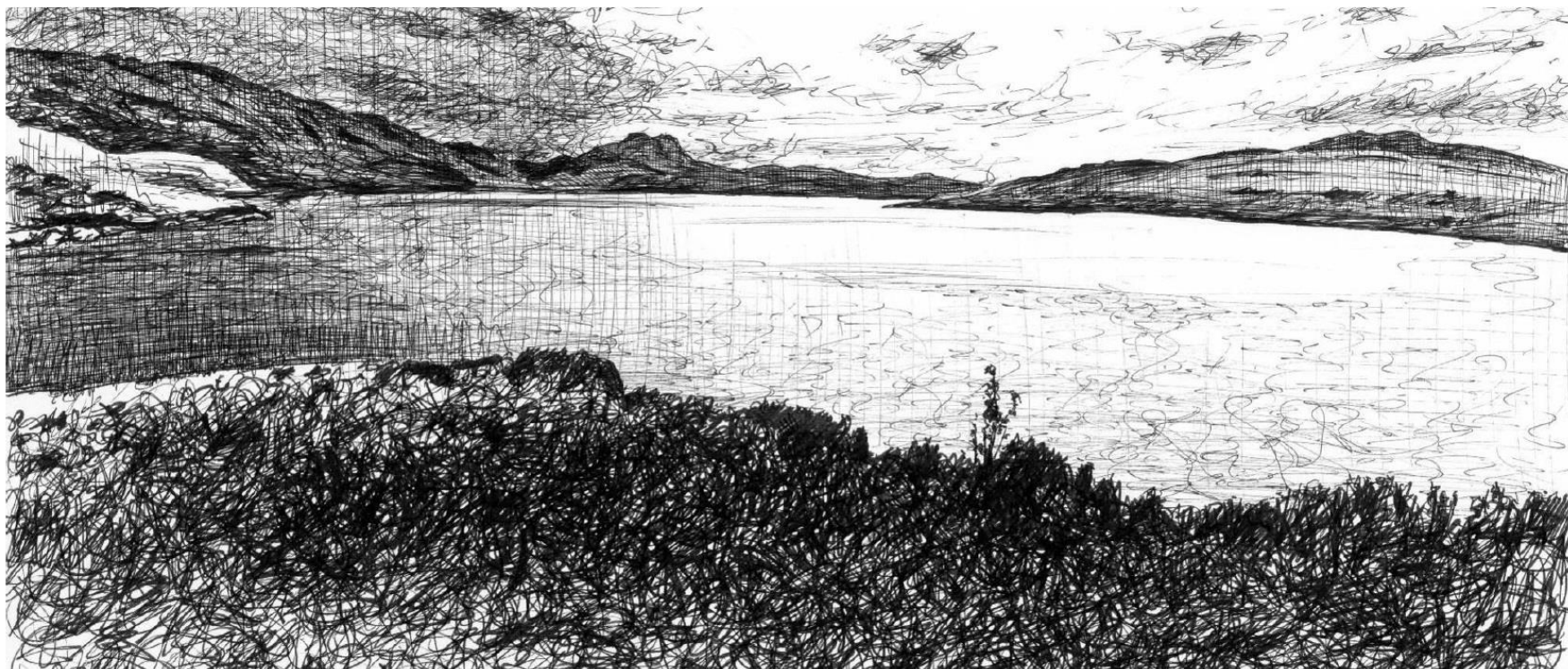


It's almost time to move on from bogs to wet heaths, but first – as requested by NPMS – a few **QUESTIONS!**

**Q1:** Which species indicate most strongly that the habitat is bog and not wet heath?

**Q2:** How do you tell common cottongrass *Eriophorum angustifolium* from hare's-tail cottongrass *E. vaginatum*?

**Q3:** How do you tell hare's-tail cottongrass from deergrass *Trichophorum germanicum*?







### ANSWERS TO QUESTIONS 1-3:

- A1:** Hare's-tail cottongrass *Eriophorum vaginatum* and the mosses *Sphagnum papillosum* and *S. divinum/medium*.
- A2:** Common cottongrass *Eriophorum angustifolium* has wider (3- mm) leaves and multiple white cottony heads on each flowering stem (those heads tending to hang to one side), and forms thin tufts or, as in the photo a couple of pages back, extensive swards. Also, its leaves turn reddish in autumn, and the groove or V-profile of the upper side of the leaf ends abruptly a few centimetres before the leaf tip, so the final part of the leaf is more solid (arrow in photo at right marks termination of groove).
- Hare's-tail cottongrass *E. vaginatum* has thin (<1 mm) wiry leaves growing in dense tussocks, and has just a single white cottony head per flowering stem. Its leaves turn dull grey-brown in autumn.
- A3:** Both species form dense tussocks of thin, wiry things but in hare's-tail cottongrass those thin wiry things are leaves (each on tapering to a pointed tip) while in deergrass they are all stems (each one with a little brownish flower spike at its tip). The actual leaves of deergrass are really small and scale-like, well-hidden down on the lowest part of the stem. While the leaves of hare's-tail cottongrass turn dull grey-brown in autumn, the stems of deergrass turn a rich golden colour at the same time of year (see photos below, of deergrass in autumn).





## TWO MORE QUESTIONS!

**Q4:** Is the main way to tell **wet heath** from **bog**

(a) by species composition, or

(b) by peat depth/topography?

**Q5:** Is the main way to tell **raised bog** from **blanket bog**

(a) by species composition, or

(b) by peat depth/topography?





## ANSWERS TO QUESTIONS 4-5:

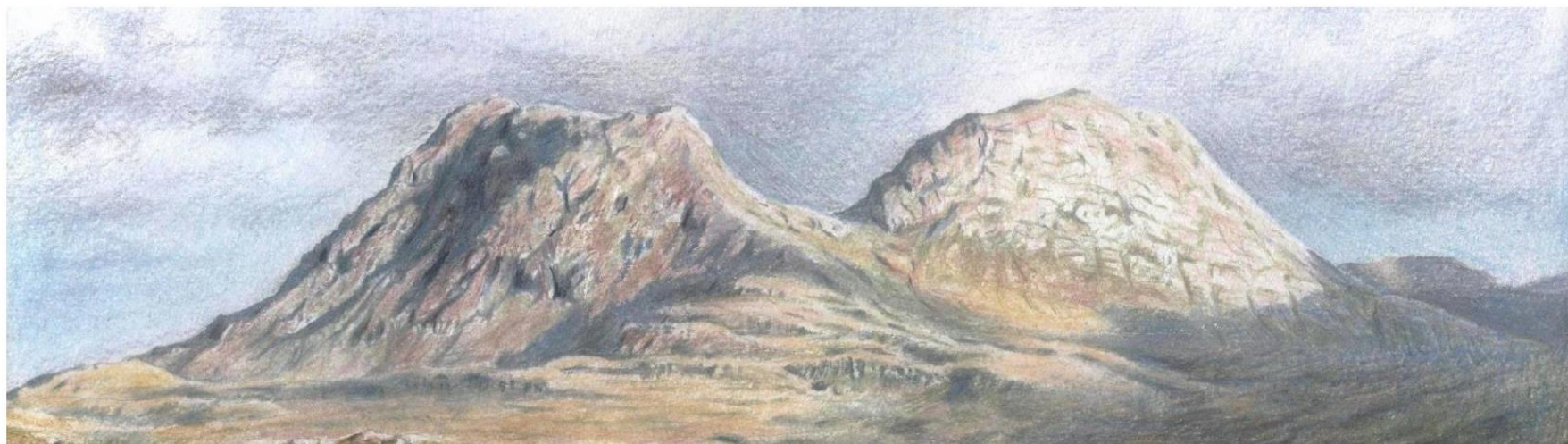
**A4: (a) by species composition**, because wet heath vegetation can be on peat of greatly varying depth, slope, etc.

**A5: (b) by topography.**

**Raised bog** = raised dome of deep peat, typically with a lag zone around the edge.

**Blanket bog** = level to variably/irregularly sloping deep peat, typically without a marginal lag zone, but there can be linear areas of flushing running through parts of the bog.

The species composition of the vegetation can be so similar on raised and blanket bogs that it is not a reliable means of differentiation.





OK – now we can move on to **wet heaths**. These vary a lot and are particularly extensive in western Scotland. In the west Highlands and Hebrides, wet heath is the single most extensive semi-natural type of habitat. In this view of Quinag (Sutherland) more than half of the lower ground is wet heath. The flatter areas are blanket bog. The steeper, higher ground has mainly dry heath but also some grassland and wet heath.





The vegetation of wet heath consists of varying mixtures of heather, bell heather, cross-leaved heath, deergrass, purple moor-grass, common cottongrass and bog myrtle. Mosses and lichens can be very common too. Here is an example of a very typical 'middle of the road' kind of wet heath, with mainly heather and deergrass, mixed with smaller amounts of cross-leaved heath and purple moor-grass, in Sutherland in June. The pale dots are heath spotted orchids *Dactylorhiza maculata*.





And here, in the foreground of this photo taken on Skye in December, is another very common form of wet heath, which is rather like the last one but is on peaty soils that are drier and shallower. The moss *Racomitrium lanuginosum* is abundant in this wet heath. The steeper slope beyond has a mix of dry and wet heaths.





Here is a more montane, relatively dry form of wet heath on wind-exposed quartzite hill ground in Wester Ross in October. It includes heather, bell heather, deergrass, purple moor-grass, dwarf juniper, mosses and lichens.





This example of similarly 'dry' wet heath, in Sutherland, is made up mostly of deergrass, heather and bell heather, with mosses (especially *Racomitrium lanuginosum*) and lichens of the genus *Cladonia*. Bell heather grows mostly in dry heaths but is also common in drier forms of wet heath, especially in the west.







Outside the Highlands wet heath is much less extensive, except in parts of Galloway where the landscape is mostly made up, in vegetation terms, of mosaics of wet heath, bog and purple moor-grass mire, and can look much like the west Highlands.





Here in the Lammermuir Hills is an area of wet heath that is unusually large for the eastern part of the Southern Uplands. This vegetation, photographed in March, is mostly heather and cross-leaved heath, with some deergrass, purple moor-grass and mosses including *Sphagnum* species (but not the bog indicator *Sphagnum* species of course).





Here is some wet heath in more of a lowland setting, in Shropshire in July. It is species-poor and consists mainly of cross-leaved heath and purple moor-grass, with some heather.





Wet heaths are mostly below the montane zone, but montane wet heath does occur in some places in the Highlands, such as here near Glen Coe. It has little or no heather, cross-leaved heath or purple moor-grass, but plenty of deergrass mixed with cold-tolerant dwarf shrubs: blaeberry, cowberry, crowberry (including the montane subspecies *hermaphroditum*) and bog bilberry *Vaccinium uliginosum*. It can occur in very subtle mosaics with slightly paler-coloured snowbed grassland containing a lot of mat grass *Nardus stricta*; both communities are present in this photo.





Very differently, in the warmer southern parts of Britain and Ireland we can find wet heaths containing southern, warm-loving species such as western gorse *Ulex gallii*, dwarf gorse *U. minor* and bristle bent *Agrostis curtisii*. Here is western gorse with cross-leaved heath and purple moor-grass in wet heath in SW Wales in August.





Here is another example, in Shropshire in July, but this is dominated by western gorse, which can mask the associated flora to some extent, but the abundance of cross-leaved heath *Erica tetralix* and purple moor-grass *Molinia caerulea* shows that this is more of a wet heath than a dry heath.





The three species of gorse *Ulex* in Britain and Ireland: all of these occur in wet heath.



### Gorse *Ulex europaeus*

The most widespread and common species. Up to 3 m tall. Calyx 10-17 mm long and bracteole 3-5 mm wide (see inset photo of flower). Leaves greyish-green and deeply grooved. On dry to damp ground with acid to quite basic soils, mainly in heaths and grassland; also shingle, cliffs, scrub and woodland margins.



### Western gorse *Ulex gallii*

Up to 2 m tall. Calyx >9 mm long and bracteole 0.6 mm wide. On dry to damp, mainly acid soils in heaths and grassland. Mainly in SW England, Wales and Ireland, but also NW England and extreme S Scotland. Listed as an NPMS positive indicator in wet heath. Leaves not so greyish-green and only shallowly or faintly grooved.



### Dwarf gorse *Ulex minor*

<1 m tall. Calyx <9 mm long and bracteole 0.6 mm wide. On dry to damp acid soils in lowland heaths in S-SE England, with outlying populations in Nottinghamshire and N Cumbria. Listed as an NPMS positive indicator in wet heath. Leaves green and faintly grooved, as in *U. gallii*.



What is **bristle bent *Agrostis curtisii***? It is a grass found in wet and dry heaths, and acid grasslands, in SW England and the extreme south of Wales. With thin wiry leaves it looks rather like wavy hair-grass *Deschampsia flexuosa* (which is a NPMS positive indicator in raised bogs) but the leaves are stiffer and greyer-green and the flowering heads are narrower with smaller and more numerous individual florets. Here are both species, so you can see the differences.



Bristle bent *Agrostis curtisii*



Wavy hair-grass *Deschampsia flexuosa* (L = flower heads; R = leaves + bases of flowering stems)







In some places we can find wet heath right down by the sea. This example, with a mix of cross-leaved heath, grasses, sedges and small herbs, is on damp mineral soils among igneous rock outcrops on the East Lothian coast.





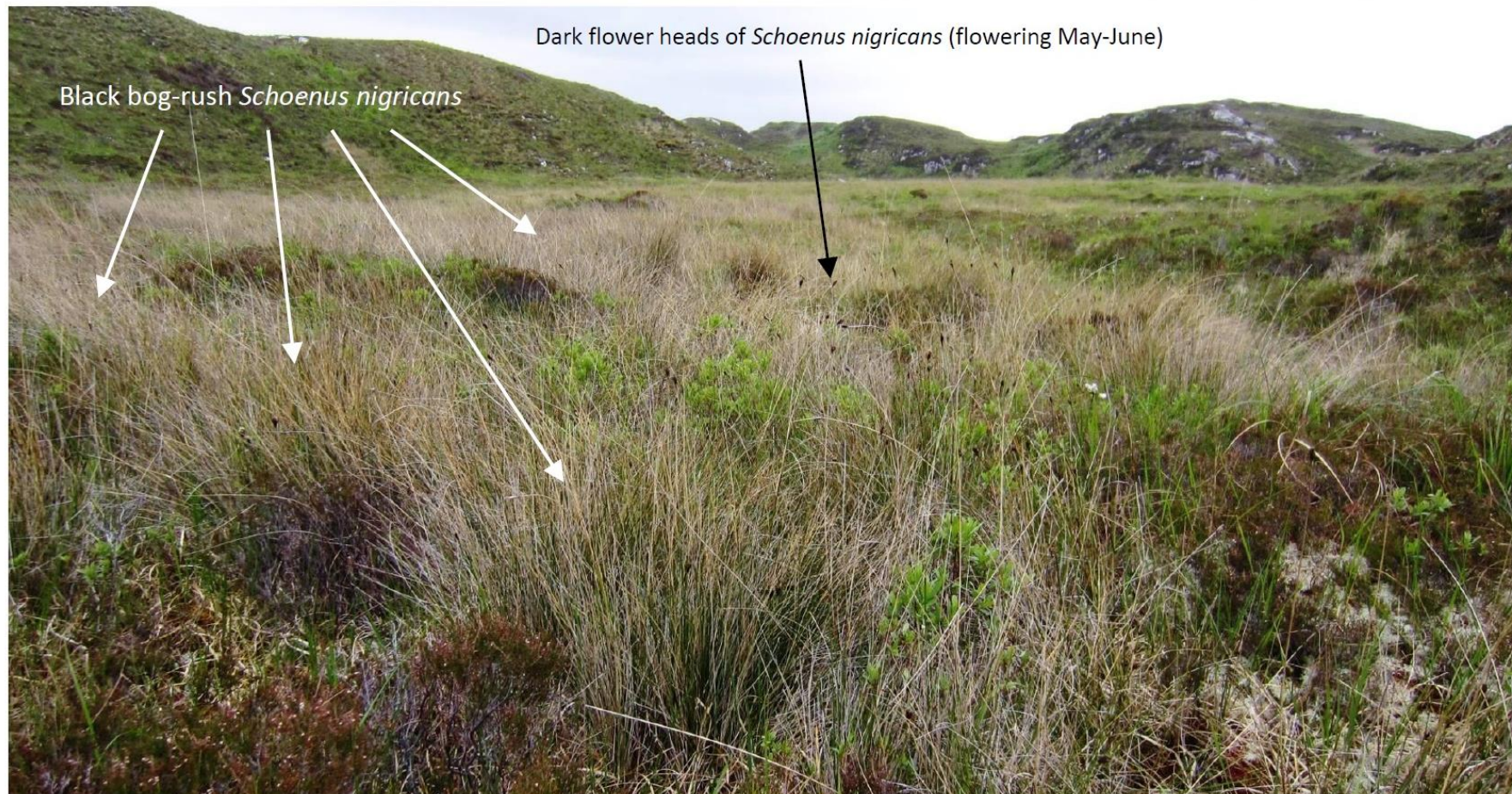
Some wet heaths have species that show the influence of flushing with base-enriched water. Areas of this vegetation are small, some of them quite linear or forming irregularly-shaped patches among more extensive heath, bog or grassland that appears not to be flushed in this way. This example of flushed wet heath, in Caithness in September, contains much carnation sedge *Carex panicea* – one of the commoner indicators of flushing and mild base-enrichment among wet heaths. Other species in the vegetation here include heather, cross-leaved heath and purple moor-grass.



Leaves with blue-grey tinge = carnation sedge *Carex panicea*



Another indicator of base-enriched flushing in wet heath (and other vegetation) is black bog-rush *Schoenus nigricans* – a kind of tussocky sedge with very dark flower heads. It is commonest in the west, in a wide range of wetland habitats including flushed wet heath. It is a NPMS positive indicator in wet heath. This example, in Sutherland in June; has *Schoenus*, other sedges, heather, cross-leaved heath, purple moor-grass, bog myrtle and mosses. Beyond are level ground with blanket bog and more flushed wet heath, and slopes with non-flushed wet heath and a little dry heath.





This is flushed wet heath in Shropshire in July. The most abundant species here is purple moor-grass, but there is also a lot of cross-leaved heath and bog asphodel – all three species are visible in this photo, as is a single plant of western gorse near the lower right corner. Carnation sedge is present but too small and well hidden to be seen in this view.





Superimposed onto all this variation in wet heaths are the effects of land management, especially grazing and burning. Here is some very grazed wet heath in the Lammermuir Hills in SE Scotland in June. Dwarf shrubs have been grazed out, and deergrass, which is not very palatable, has become the most abundant vascular species. In some other places, such as that shown in the photo on the previous page, grazing can lead to an increase in purple moor-grass.





Here is an example of wet heath, in the eastern Highlands, that has been burned for grouse-moor management purposes. Cross-leaved heath appears dominant in this view, though short heather is abundant too and will become more prominent in subsequent years. As with much burned heath, the vegetation is species-poor.





Oh – I nearly forgot – I said earlier that I would show a photo of a dominance of purple moor-grass that appears likely to have been derived from previous wet heath as a result of some kind of combination of grazing and burning. So, here we are – this example is in Morvern, in the west Highlands, in early spring. There's some bog myrtle here too.





We have already seen a good number of the NPMS positive indicators in bogs and wet heaths. Here are a some more:



Fl 6-8

**Heath spotted orchid *Dactylorhiza maculata***

Widespread in dry and wet heaths (and grassland and various wetland habitats), especially in upland areas. The commonest orchid in wet heaths. Can also grow in bogs. Flowers vary from pale pink to whitish. Flower spike short, with blunt or flattish top. NPMS positive indicator in wet heaths.



Fl 5-9

**Tormentil *Potentilla erecta***

Flowers with 4 yellow petals. Leaves with 3 leaflets + 2 leaflet-like stipules at the point where the leaf joins the stem. Grows mainly on acid soils in grasslands, heaths and woods. NPMS positive indicator in blanket bogs and wet heaths.



Fl 4-9

**Lousewort *Pedicularis sylvatica***

Short, with pink flowers and intricately divided leaves. Plants commonly branched from the base. Mainly in dampish acid soils. NPMS positive indicator in wet heaths. (Marsh lousewort *P. palustris* is taller, with slightly darker flowers and has side branches growing out from a vertical main stem; and grows in neutral to basic mires.)





Five sedges that are NPMS positive indicator species in bogs and wet heaths



Fl 5-6 (fruits 6-7)

**Carnation sedge *Carex panicea***

Leaves pale grey-green on both sides, 2-5 mm wide, spreading out widely. On various soil types. NPMS positive indicator in raised bogs, but scarce in bogs. Common in flushed wet heaths, grasslands, etc.



Fl 5-7 (fruits 6-8)

**Common sedge *Carex nigra***

Leaves mid grey-green, 1-3 mm wide and growing up (not widely spreading). Mainly on damp/wet acid soils. NPMS positive indicator in raised bogs.



Fl 7-8 (fruits 7-8)

**Bottle sedge *Carex rostrata***

Leaves 2-7 mm wide, grey-green on upper side and darker, shinier green below, not widely spreading. Can form tall lush swards. Large female spikes (inset). In a wide range of wetlands. NPMS positive indicator in bogs, but scarcer in bogs than in other wetlands.



Fruits 7-8

**Bog sedge *Carex limosa***

Low and inconspicuous. Leaves 1-2 mm wide, greyish-green, not widely spreading. Female spikes short and broad, hanging on long stalks. Mainly in and around bog pools. NPMS positive indicator in blanket bog.



Fl 6-7 (fruits 6-7)

**Star sedge *Carex echinata***

Leaves 1-2.5 mm wide, mid green. Flowers/fruits in distinctive star-like groups. Mainly in acid sedge mires, but can be scattered thinly through bogs and wet heaths. NPMS positive indicator in raised bogs.



Here are the species listed as **NPMS negative indicators** in bog and wet heath. All of these are listed as negative indicators in all of the three fine-scale habitats (blanket bog, raised bog and wet heath).



**Birch *Betula pendula / pubescens*.** Young birch occurs naturally in some wet heaths (and the drier parts of some bogs) where grazing is sufficiently light. It is seen more positively where new woodland is desired – i.e. more in heaths than bogs.



**Conifer seedlings or saplings.** Native pine and juniper can grow naturally in some wet heath and bog. Other young conifer growth here is generally seen negatively: e.g. invasive spruce, or tree growth with potential to have a drying effect in bogs.



**Creeping thistle *Cirsium arvense*.** Prickles on leaves but not on stems. Favours nutrient-rich and/or disturbed soils. Very scarce in bogs and wet heaths because these habitats are too acid and nutrient-poor.



**Stinging nettle *Urtica dioica*.** Favours nutrient-rich soils. Very scarce in bogs and wet heaths because these habitats are acid and nutrient-poor.



**Tall tufted rushes *Juncus* species.** The species in question here is generally soft rush *J. effusus*, which is not really a bog or wet heath species but can grow in disturbed places in these habitats. Note: also found more naturally in sedge mires running through bogs and heaths.



You thought I'd forgotten, but you were wrong! Because it is...

## TIME FOR SOME WET HEATH QUESTIONS!

**Q6:** What are generally **the two most abundant and prominent graminoids** (= grasses + sedges + rushes + woodrushes) in wet heaths?

**Q7:** **Leaves** of **carnation** sedge and **common** sedge – what's the **difference**?





## ANSWERS TO QUESTIONS 6-8:

**A6:** Purple moor-grass and deergrass.

**A7:** Carnation sedge leaves are **wider, paler** and **more widely spreading** than those of common sedge.





## ANOTHER QUESTION...

**Q8:** Would you expect a wet heath that has lost its dwarf shrubs because of heavy grazing to become:

- (a) more **grassy**?
- (b) more **sedge**-dominated?
- (c) **either/both**?





## ANSWER TO QUESTION 8:

**(c) Either/both.** Grazing can make the wet heath vegetation either more grassy (esp. purple moor-grass, as in photos below and on page 44) or more sedge-dominated (esp. deergrass, as in photo on page 45), or a mix of both grasses and sedges in abundance together (typically purple moor-grass + deergrass).

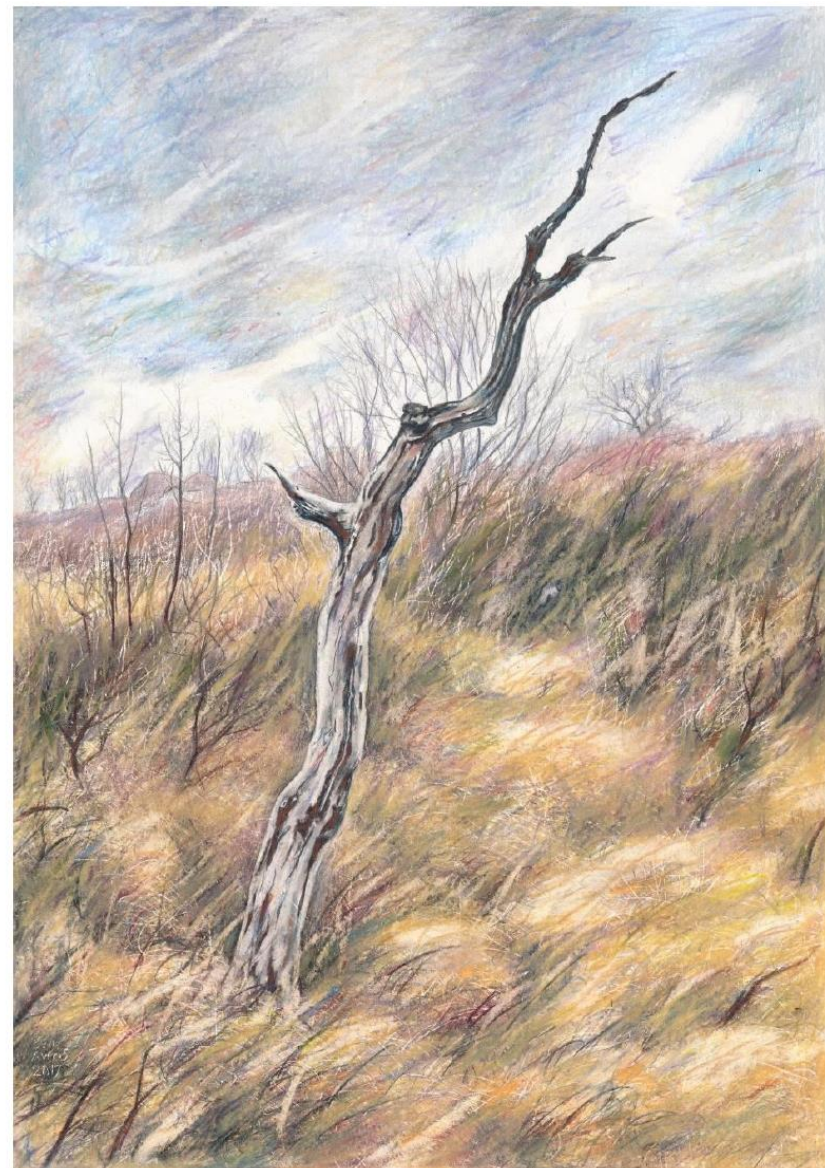




*and finally...*

## QUESTION 9:

Do you think this kind of wet heath scene (the vegetation here being mainly purple moor-grass, heather and bog myrtle, with some young downy birch and willow) should be looked upon **POSITIVELY** or **NEGATIVELY** in ecological/conservation terms?





## WELL DONE – YOUR ANSWER TO QUESTION 9 WAS RIGHT!

But how did I know what your answer was?

I didn't. But whatever it was – positive or negative, or even wavering between the two – you can reckon on it being right in some way because (a) it will make sense of some sort (unless it was a really stupid answer – but I'm prepared to give you the benefit of the doubt on that matter), and (b) you aren't alone in your particular assessment because there will be others who agree with you.

A **POSITIVE** assessment could consider the young tree/shrub regeneration as a desirable example of going back to nature, or rewilding, having judged the wet heath to be degraded in that it should really be woodland (because current tree growth shows it to be within the potential woodland zone, and the old dead tree indicates a history of tree growth).

A **NEGATIVE** assessment could recognise the wet heath as being of ecological interest in its own right (as many wet heaths are, regardless of whether their open unwooded nature appears natural or not) and threatened by the colonisation of young tree growth that might lead to losses of special heathland interest as the habitat develops toward woodland. This could be of particular concern if, in order to encourage young tree growth, there has been such a big reduction in grazing that a few common plant species are now growing taller and thicker and more dominant at the exclusion of less competitive species of special interest.

So, opinions differ, and even professional ecologists, conservationists, landowners, land managers, etc, can't all agree on this!







And so it comes to be that here in blanket bog at the edge of Rannoch Moor, looking upslope to submontane wet heath, bog and grassland mosaics and eventually to very different montane ground, we come to the end of this introduction to bogs and wet heaths. I hope you found it interesting and worthwhile.

